Space Weather Forecast

Issued on Tuesday, 16 April 2024 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Solar activity increased with Moderate flares likely and a slight chance of Strong flares. Expected coronal mass ejection (CME) influence bring a chance of G1-G2/Minor-Moderate Geomagnetic storms into the 17-18th April.

Solar Activity: Activity is currently Moderate. The largest flare was a Moderate flare at 15/1932UTC from the large region in the northeast. There are twelve sunspot regions currently visible on the disk. The region in the northwest is the largest, though now classified somewhat more simply, with a slight reduction in flare risk. The region in the northeast is the second largest and likely most complex region magnetically, presenting the largest current flare risk. The complex multi spot region in the southeast also remains a likely area for flare activity. Continued slight growth visible across multiple spots within this southeast cluster of active regions, with two new areas identified. Remaining regions appear generally more stable with little change in recent hours.

Two coronal mass ejections were observed, the first leaving the northeastern quadrant of the Sun early 15th Apr, analysis suggests this may impact Earth late on the 17th or early 18th April, the second off the northwest later in the day is not currently expected to impact Earth although analysis remains ongoing.

Solar Wind / Geomagnetic Activity: Solar winds were slow-ambient, around 330 km/s, a sudden increase around 15/1730UTC to 360km/s likely indicative of a weak CME arrival, with speeds remaining around 360-410m/s through the remainder of the period. The Interplanetary magnetic field (IMF) strength, Bt, was weak until it increased to moderate after the CME arrival and remained so. The important north-south component, Bz, becoming moderately negative following CME arrival. Resultant geomagnetic activity was initially Quiet but increased to become Unsettled to Active (Kp 3-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Overall Moderate solar activity is expected to persist, with occasional Moderate flares likely and a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: Current conditions remain enhanced following coronal mass ejection (CME) arrival later on the 15th Apr, this expected to slowly ease during day 1 (16 Apr). Further CME influence expected into days 2 and 3 (17-18 Apr) given the potential for glancing blows from CMEs that left the sun on the 14-15th Apr.
Geomagnetic activity is expected to be generally Unsettled to Active, with a slight chance of G1/Minor storm periods on day 1 (16 Apr) giving ongoing CME effects. Further CME influence expected into days 2-3 (17-18 Apr) seeing an increased chance of G1-G2/Minor-Moderate storm periods before conditions looks to calm into day 4 (19 Apr).

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no Solar Radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	40	30	10
Strong	G3	No	1	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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